

## ABSTRACT

A pipelined, simultaneous and redundantly threaded ("SRT") processor comprising, among other components, load/store units configured to perform load and store operations to or from data locations such as a data cache and data registers and a cycle counter configured to keep a running  
5 count of processor clock cycles. The processor is configured to detect transient faults during program execution by executing instructions in at least two redundant copies of a program thread and wherein false errors caused by incorrectly replicating cycle count values in the redundant program threads are avoided by implementing a cycle count queue for storing the actual values fetched by read cycle count instructions in the first program thread. The load/store units then access the cycle count queue and not the cycle counter to fetch cycle count values in response to read cycle count instructions in the second program thread.

TOP SECRET